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Re: **Application Serial No.: 10/684,836**

Message:

This Reply Brief is in response to the Examiner's Answer dated February 19, 2008.

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Docket No.: 050395-0234 **PATENT**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Customer Number: 20277

Tooru MORITA, et al. : Confirmation Number: 9853

Application No.: 10/684,836 : Group Art Unit: 1797

Filed: October 15, 2003 : Examiner: Krishnan S. Menon

For: POROUS MULTILAYERED HOLLOW FIBER AND FILTRATION MODULE, AND METHOD OF MANUFACTURING POROUS MULTILAYERED HOLLOW FIBER

REPLY BRIEF PURSUANT TO 37 C.F.R. § 41.41

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is Appellant(s) Reply Brief in response to the Examiner's Answer, dated February 19, 2008. Appellant reasserts all arguments contained in the Principal Brief.

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Status of Claims

Claims 2-5, 7, 9 and 11-12 are canceled. Claims 1, 6, 8 and 10 are pending. Claims 1, 8 and 10 stand rejected and are on appeal. The rejection of claim 6 was withdrawn in the Examiner's Answer, whereby claim 6 has been found to contain allowable subject matter.

Grounds of Rejection To Be Reviewed By Appeal

(1) Whether claims 1, 8 and 10 are definite within the meaning of 35 U.S.C. § 112, second paragraph.

(2) Whether claims 1, 8 and 10 are patentable within the meaning of 35 U.S.C. § 103 over JP '095 in view of JP '758 or JP '406. Claims 8 and 10 stand or fall based on the merits of claim 1.

ARGUMENTS

On page 12, fifth line from the bottom, of the Examiner's Answer, the Examiner asserts that the technical publications, submitted by Applicants to evidence that the claim language "where (X) is a particle diameter of particles ..." is standard terminology used in the industry to define a filter grade, "is not persuasive because the evidences provided only shows the micron rating of the filters specified ... [but] fail to provide any definition for the micron rating." However, by defining the micron rating of the filters in terms of a particle diameter *without referencing the "smallest diameter of the particle,"* the technical publications evidence that the language used in claim 1 is the standard in the art. Hence, contrary to the Examiner's assertion, the technical publications in fact define the micron rating relative to a "particle diameter captured" as claimed rather than by the Examiner's definition of the "smallest particle diameter captured." Applicants submit that the claim language should be consistent with the industry standard language rather than the Examiner's preferred language.

On page 13, lines 2-4 of the Examiner's Answer, the Examiner asserts that "it was shown that the filter structure as claimed is obvious over the cited references, *which the applicant does not seem to dispute*" (emphasis added). This is patently incorrect. In direct contrast, Applicants have repeatedly asserted that the claimed filter structure is NOT obvious over the cited references.

On page 14, lines 18-19 of the Examiner's Answer, the Examiner asserts that "[w]hat is claimed is only sorting or selecting an existing filter for a purpose." This too is patently incorrect. In direct contrast, Applicants have repeatedly asserted that the claimed filter structure is NOT an "existing" filter. Indeed, none of the cited prior art discloses or suggests the novel ***structure*** of the claimed filter. The claims define a filter structure which is defined by the combined parameters of the filter grade (porosity, etc.) and RFL defined solely by Applicants, which filter structure does not currently exist in the cited art.

It is respectfully submitted that claim 1 embodies a filter structure that is both novel and non-obvious. Due to the microscopic nature of the structural characteristics of filters, claim 1 uses industry standard filter grade terminology to describe the porosity, etc., of the claimed filter in relation to the RFL value (relative fibril length). This is not tantamount to merely selecting an existing filter. The filter grade is represented by (X) in claim 1, where (X) is a particle diameter of particles captured when the particle trapping ratio is equal to or more than 90 % in the case where the filtration is done under an elevated pressure of 0.1 MPa. The filter grade "X" is not a physical limitation of the filter *per se* but rather is a conventional standard descriptive term used to identify the internal, microscopic structure of a filter. The Examiner does not appear to understand this distinction.

The Examiner should consider the Vickers hardness test used as an industry standard to describe "hardness" of materials. The basic principle is to observe the questioned materials' ability to resist plastic deformation from a standard source. The hardness number is not really a true property of the material but is an empirical value. Accordingly, an inventor can make, for example, a new and non-obvious alloy material which is described using the standard Vickers hardness number. Similarly, the filter grade "X" of the present invention represents the filtering ability relative to a standard source, where the "X" value is not a true property of the material but is an empirical value. In this case, the inventors of the present invention have made a new and non-obvious filter structure which is described by using the standard filter grade value "X" *in combination with the RFL value conceived solely by Applicants.*

On page 14, lines 5-15 of the Examiner's Answer, the Examiner asserts that "[t]here are no special steps or process conditions described in the specification that can be attributed to a unique filter structure." The relevancy of this comment is not understood. The Examiner appears to believe, incorrectly, that novel structures can only be made using novel processes. As just one example, molding plastics is a conventional processing technique. Nonetheless, one can use a conventional molding process to create a novel plastic structure. The claimed invention is a novel structure which can be manufactured using conventional processing techniques. In this regard, on page 15, lines 14-15 of the Examiner's Answer, the Examiner asserts that "the specification lacks a step or steps in the process of making the [claimed] filter." However, several portions of Applicants' specification disclose various manufacturing methods that can be used to make the filter (*see. e.g.,* pages 28+, which describes just one example, other portions of the specification include other processing examples). Further, Figures 3-4 of Applicants' drawings illustrate embodiments of the present invention evidencing that, contrary to the Examiner's assertion on page 15, lines 9-15 of the Examiner's Answer, there IS a guarantee that a filter within the claimed range can be made.

On page 15, lines 7-8 of the Examiner's Answer, the Examiner asserts that the "declaration only shows that the filters [using the disclosure of JP '095] did not pass." However, the declaration was submitted to rebut the Examiner's unsupported allegation that JP '095 would *inherently* include filters structured to be within the claimed range. As admitted by the Examiner, the declaration proves that there are filters according to JP '095 which are NOT within the claimed range, thereby refuting the Examiner's inherency position. Moreover, the declaration by Tooru Morita ***unequivocally declared*** that JP '095 does not describe or enable a process by which a hollow fiber would have a structure within the claimed range and that JP

'095 discloses only hollow fibers that are outside of the claimed range. Given that the inventor of JP '095 is an inventor of the present application, this declaration must be accepted as fact absent direct contrary evidence that may be produced by the Examiner.[1] The Examiner provides no such evidence that JP '095 discloses the specific filter structure claimed.

On page 15, last three lines – page 16, lines 1-6 of the Examiner's Answer, the Examiner asserts that the claimed variables "have nothing to do with the filtration layer structure; they are only parameters coined by the inventor/applicant for the filter selection process ... X and Y were assumed to be result-effective variables." However, in direct contrast to the Examiner's assertion, the claimed variables define the resulting internal, microscopic structure of the novel filter of the present invention (*see, e.g.*, page 23, line 22 – page 24, line 5 of Applicants' specification, "... the structure of filtration layer 12 is defined by (Y=L/X)"). Accordingly, the claimed variables have everything to do with the filtration layer structure.

Moreover, contrary to the Examiner's admitted false assumption, X and Y are NOT result-effective variables because the cited prior art is completely silent as to such variables let alone recognize them as effecting a particular result. Only Applicants have recognized and considered the importance of the correlation between "X" and "RFL" as a result-effective variable. Indeed, one of the features of the present invention is directed to the recognition of the correlation between "X" and "RFL" where the parameter "RFL" was conceived exclusively by Mr. Tooru Morita for the present application. JP '095 is silent as to such a correlation; and therefore provides no disclosure to enable one of ordinary skill in the art to make the claimed filter configuration, much less provide any motivation to modify its disclosed processes to obtain a filter configuration within the claimed range.

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[1] *In re DeBaun*, 214 USPQ 933 (CCPA 1982).

Indeed, as a result of intensive research, "the present inventor has found that the clogging of pores in a porous material is caused by solid particles, mostly depending on the maximum cross-dimensions of numerous pores existing surrounded with the fibrous frameworks in the filtration surface, which is the outermost surface portion of the filtration layer. Also, it was found that the flow rate in a steady state after some elapse of time as well as the flow rate in an initial stage was important to achieve satisfactory filtration property for a long period of time" (page 12, lines 15+ of Applicants' specification). Accordingly, only Applicants have recognized and considered these particular drawbacks (and their causes) of conventional filter configurations, and conceived of a novel filter construction which can make it possible to obviate said drawbacks.

The cited prior art is silent as to the prevention of degradation in the flow rate due to the clogging caused by solid particles ***over the elapse of time***. As described on page 3, line 9 – page 5 of Applicants' specification, the conventional filter are subject to drawbacks in that clogging ***over time*** causes a reduction in filter recovery efficiency. Only Applicants have recognized and considered this parameter, and conceived of the novel combination which can make it possible to provide porous multilayered hollow fibers and filtration modules in which clogging due to solid particles does not occur in the pores of porous materials and which can maintain excellent filtration property for a long time even if a high turbidity solution is filtered. According to the invention, the degradation of the flow rate due to the elapse of time can be prevented and the filtration property can be recovered easily by back wash reverse filtration.

That is, what is important, and which only Applicants have recognized, is the filtration property in a steady state after some elapse of time in usage (*see* page 6, lines 3-13 of Applicants' specification). The cited prior art is conscious only of initial flow rates and filtering, without considering a filter's longevity and the issues related thereto such as irreversible, rapid clogging, etc.. Accordingly, the cited prior art does not provide any motivation for reaching the novel and non-obvious filter configuration conceived by Applicants which was invented in response to the longevity issues identified solely by Applicants.

As noted in Applicants' specification, the cited prior art including JP '095 discloses filters in which particles are captured in pores formed in a three-dimensional network through the *entire filtration layer including the thickness thereof.* Therefore, *particles accumulate gradually in the pores* over an elapse of time, causing clogging, which results in the degradation of the flow rate of the filtration layer as a whole.

In contrast, the present invention is directed to outside-inside filtration *in combination with a novel filter structure* designed such that solid particles to be separated in the steady state after the early stage of the solid-liquid separation treatment *do not irreversibly enter into pores* and can be easily removed by back wash reverse filtration or the like. In other words, the present invention is designed to reduce/prevent irreversible particle capture into pores in the filtration layer and the supporting layer. Accordingly, most of the solid particles can be repulsed *at the outer surface in the filtration layer so as to be easily removed, whereby clogging can be prevented,* and consequently the permeability of liquid can be maintained. The claimed novel filter configuration was conceived to enable realizing the aforementioned effects which were recognized and considered solely by Applicants.

It is respectfully submitted that JP '095 teaches away from outside-inside filtration. As described in the last three lines of paragraph 40 of the English translation for JP '095, outside-inside filtration was used as a *comparative* example to the inventive inside-outside filtration device of JP '095; where the outside-inside filter had leaks after 120 minutes while the inventive

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inside-outside filter did not. In this regard, one of ordinary skill in the art would not desire particle repulsion *at the filter surface* in an inside-outside filter such as the one disclosed in JP '095 because it would clog the internal flow channel.

Moreover, none of the cited prior art recognizes the clogging problem arising specifically from capturing particles within the entire filter thickness as done in the conventional outside-inside filtration devices, thereby providing no guidance or motivation to reach the claimed filter configuration specifically designed for effecting particle repulsion *at the filter surface* in outside-inside filtration devices.

In sum, the cited prior art does not disclose or suggest the claimed filter structure as recited in claim 1, and further does not provide any motivation for reaching the claimed filter structure.

For all of the foregoing reasons, Appellant respectfully reasserts the arguments presented in Appellant's Brief supporting the position that the grounds of rejection of the claims on appeal are in error and should be reversed.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,
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